

The Roadmap: Future Opportunities for Bioengagement in the MENA Region

**Implementing the Recommendations from the AAAS Project on Future
Opportunities for Bioengagement in the Broader MENA Region**

Full Report and Recommendations available at
<http://www.aaas.org/report/future-opportunities-bioengagement-mena-region>

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In the early-2000s, the U.S. government began engaging scientists and public health officials in the countries of the Middle East and North Africa (MENA) to reduce the risk that individuals and organizations might contribute to the use of pathogens to harm people or the development of biological weapons. Initial engagement efforts began in Iraq and Libya, both of which had offensive biological weapons programs. These initial efforts focused on supporting former weapons scientists as they pursued peaceful research activities. When U.S. bioengagement efforts expanded beyond Iraq and Libya in the mid-2000s, the focus shifted from supporting peaceful research to improving biosafety and biosecurity training of laboratory staff, enhancing physical security of research and diagnostic facilities, and building local capacity to identify infectious disease outbreaks (i.e., biosurveillance or infectious disease surveillance). Countries that never had offensive biological weapons programs and scientists and public health officials who had never worked with biological weapons (or intended to work with biological agents) were now being included in bioengagement activities. This broad inclusion of scientific experts has raised a significant challenge: **how could bioengagement activities be developed to reduce the risk that pathogens could be used for harm while addressing local needs and all in full partnership with regional scientists and health officials.**

The broader Middle East and North Africa comprises many countries, each of which have distinct cultures, dialects and/or languages, ties to the international community, and governing frameworks. The culture, society, and language of these countries have been influenced by European colonization and interest in the region. While Arabic is spoken across the region, the dialects vary by country and location. However in some countries (such as Morocco, Tunisia, and Algeria), French is the primary spoken language. Similarly, culture and religion differs across the region. In addition, different government structures – including monarchies, democratic governments, or authoritarian regimes – exist in the region. These differences strongly influence the effectiveness and local acceptance of scientific engagement activities.

The Path Forward

Within this broader context, the American Association for the Advancement of Science (AAAS) Center for Science, Technology, and Security Policy embarked on a year-long project to identify new opportunities and approaches for bioengagement that are sustainable, culturally accepted, and locally needed. This project involved a subgrant reviewing past and current biosafety and biosecurity activities across the broader MENA region, a commissioned paper describing the lessons learned from past science engagement, a commissioned paper suggesting new approaches for designing activities to be culturally sensitive, and two consultation meetings – in Morocco and Jordan – with life scientists, environmental scientists, public health officials, and animal health experts. The map shows the countries included in at least one aspect of this project (**Figure 1**).

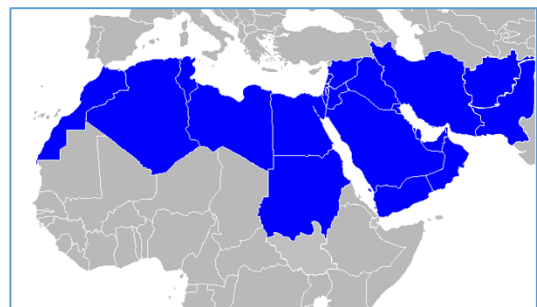


Figure 1. Broader MENA region included in the project.

Based on the information learned, AAAS recommended six opportunities and six approaches for future bioengagement between U.S. and MENA scientists that promote long-term beneficial outcomes (**Text Box 1**).

Text Box 1. Future Opportunities and Approaches for Bioengagement in the MENA Region

Recommended Opportunities

- Opportunity #1:* Facilitate the development of national strategies and implementation plans for addressing biological risks.
- Opportunity #2:* Encourage regional efforts to address biological risks through cooperation, regional resource development, and strategy development.
- Opportunity #3:* Enhance regional capacity to manage and dispose of hazardous biological waste and ensure the safe transportation of hazardous biological materials.
- Opportunity #4:* Revive the bilateral Science and Technology Agreements and support for scientific cooperation.
- Opportunity #5:* Support cooperative research in areas that affect the research environment, including the behavioral sciences.
- Opportunity #6:* Support scientific exchanges with U.S. and regional scientists to transfer knowledge about how to address biological risks.

Recommended Approaches to Promote Sustainability

- Support bioengagement programs that promote scientific leadership and address biological risks as part of the entire scientific system.
- Support programs whose sole purpose is to build trust and transparency between U.S. implementers and regional scientists.
- Tailor training and other activities to meet the actual needs within the region.
- Support programs that develop and maintain scientific partnerships in research, behavioral training, and capacity building.
- Increase local ownership of activities by involving local scientists in the development of programs and evaluation criteria for programs.
- Develop programs that build on local knowledge and expertise in addressing biological risks.

AAAS recommended six process improvements to enhance current and future bioengagement in the MENA region (**Text Box 2**).

Text Box 2. Suggested Improvements for the Scientific Engagement Process

- Increase coordination of bioengagement efforts in the region.
- Design initiatives that engage both government and nongovernmental scientists to promote both top down and bottom up approaches to addressing biological risks.
- Design bioengagement programs that can easily exist within the broader scientific environment in recipient countries and built on existing governing frameworks.
- Encourage donor and recipient countries to contribute to the funding and developing of bioengagement programs.
- Develop a tiered system of evaluation that includes broader criteria to assess the entire program, metrics to assess individual activities, and measures for scientists to demonstrate value of their participation to their superiors.

AAAS discussed the project and recommendations with the U.S. Department of State, Department of Defense, Centers for Disease Control and Prevention, National Institute of Allergy and Infectious Diseases, Agricultural Research Service of the USDA, Office of Naval Research Global, the National Security Staff, and a select group of U.S. nongovernmental organizations (including CRDF Global, Sandia National Laboratories, Elizabeth R. Griffin Foundation, National Academy of Sciences, Los Alamos National Laboratory, and three universities). The purpose of these discussions was: 1) to inform relevant U.S. government

agencies and non-governmental organizations about the project and recommendations; and 2) to determine which recommendations were of greatest relevance to each organization. The discussion with nongovernmental organizations took place in a roundtable format.

The following roadmap describes how each organization and sector could effectively support and/or implement the recommendations to enhance future bioengagement between U.S. and MENA countries.

The Roadmap

The recommended opportunities for future bioengagement fall in the nexus between local science and health interests, local safety and security interests, U.S. science and health interests, and U.S. security interests (**Figure 2**). This set of four overlapping interests lies in the intersection of five broad, but overlapping areas – security; diplomacy; and science, health, and agriculture; law and governance; and culture and religion (**Figure 3**).

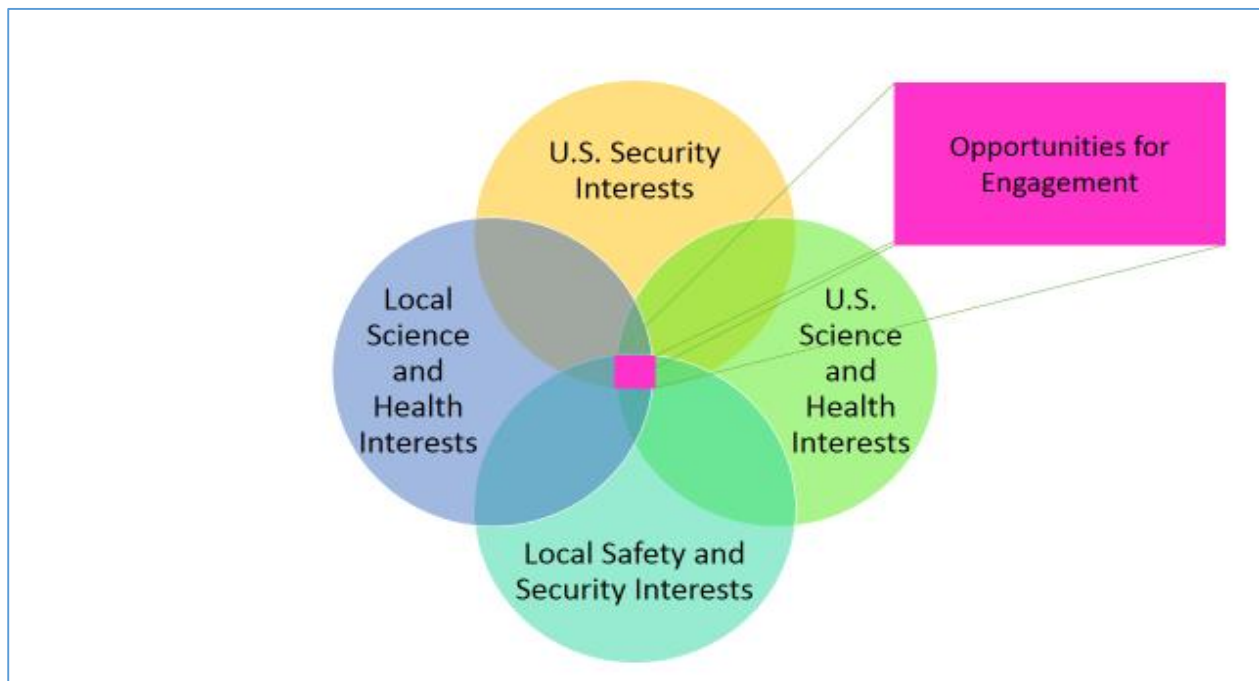


Figure 2. Overlapping interests within which future bioengagement opportunities

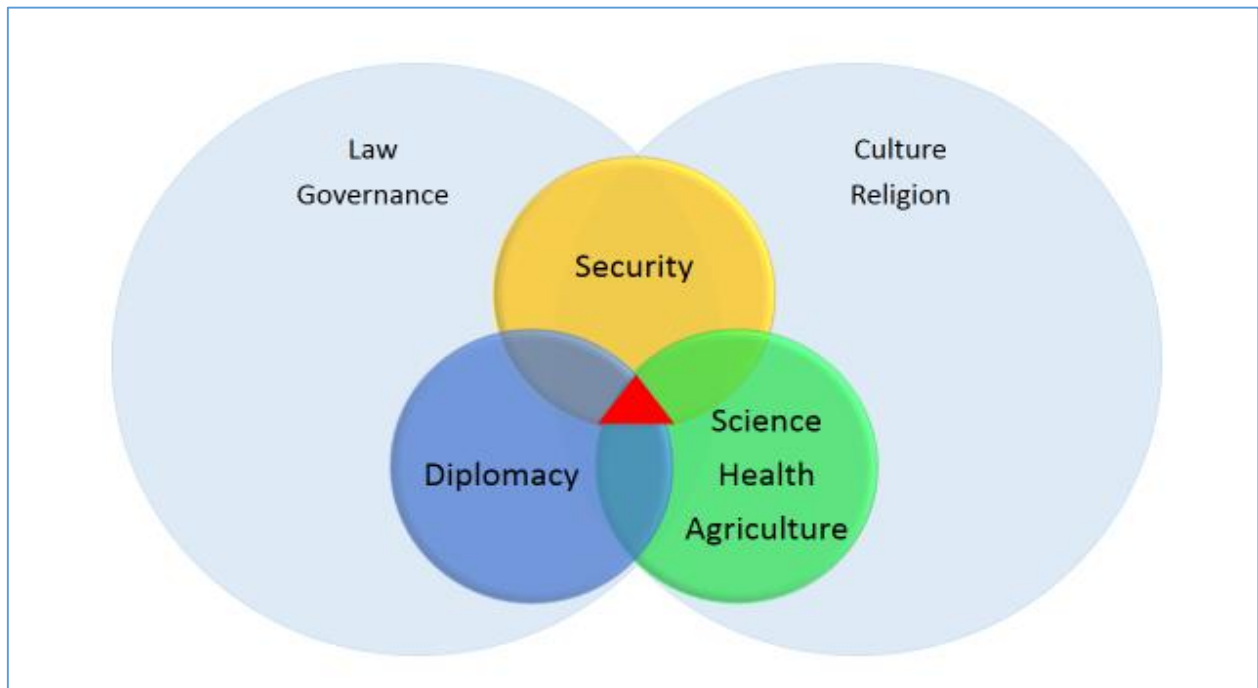


Figure 3. Overlapping areas in which U.S. and regional interests exist.

The opportunities can be divided into four relational groups (**Figure 4**). A table depicting the relevance of the recommended opportunities to several U.S. government agencies provides a snapshot of how the opportunities could be supported and implemented (**Table 1**).

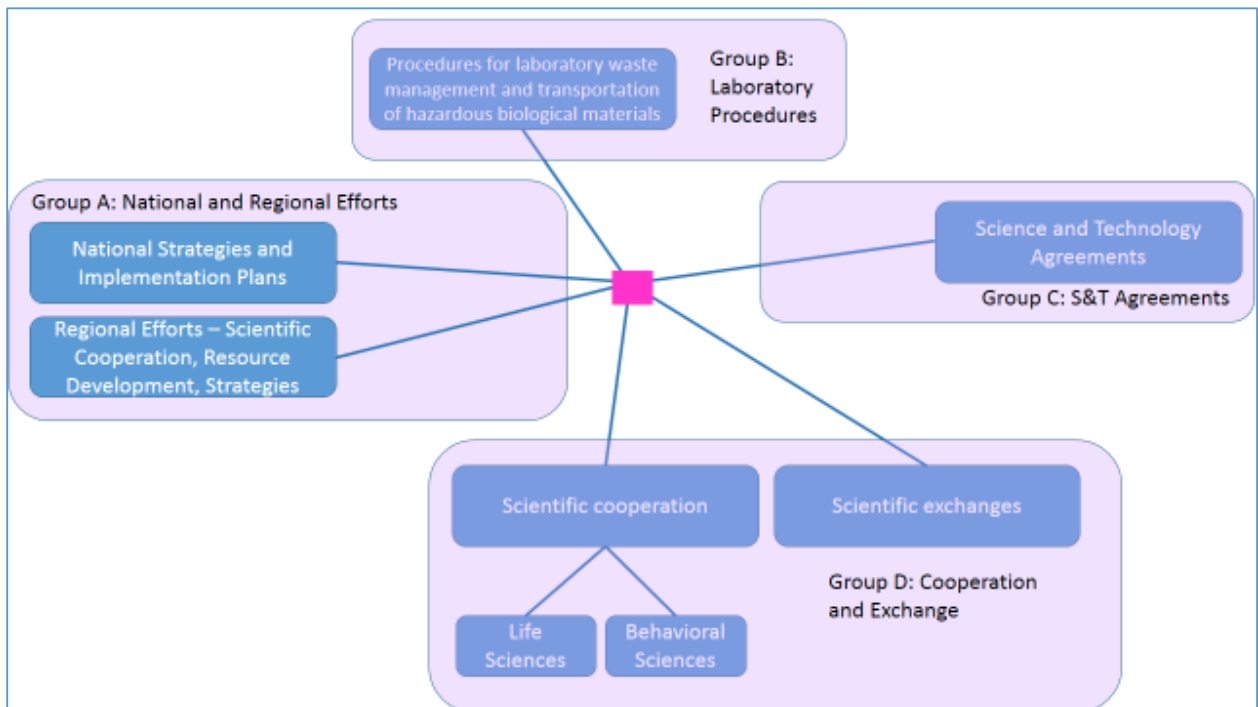


Figure 4. Relational grouping of bioengagement opportunities.

Group A: National and Regional Efforts

Opportunity #1 (the development of national strategies and implementation plans to address biological risks) and *Opportunity #2* (regional cooperation, resource development, and strategy development to address biological risks) comprise one relational group. The U.S. Department of Defense Cooperative Biological Engagement Program (CBEP), Department of State Biosecurity Engagement Program (BEP), and U.S. Department of Agriculture Agricultural Research Service (ARS) are well-suited to assist the development of national plans and regional efforts. In addition, the U.S. Agency for International Development (USAID) is able to assist with regional efforts. Both of these opportunities would achieve the funding missions of BEP and CBEP.

Group B: Laboratory Procedures

Opportunity #3 (development of procedures for laboratory waste management and transportation of hazardous materials) is the most tangible of the recommended opportunities and meets the funding mission of CBEP and BEP. Scientists from the ARS, the U.S. Centers for Disease Control and Prevention (CDC), and U.S. National Institute of Allergy and Infectious Diseases (NIAID) possess the necessary expertise to assist MENA scientists and health officials develop standard operating procedures for waste management and transportation of biological materials.

During the roundtable discussion with NGOs, the participants suggested the U.S. government fund a collaborative project that would involve several organizations working together to achieve a specific goal, such as the development of waste management procedures. This project would be implemented over several years and involve organizations where and when their expertise is needed. A brief description of the roles of NGOs for the collaborative. **(Figure 5).**

This demonstration project involves:



Figure 5. Demonstration project on regional collaboration on waste management.

- Scientific organizations could carry out initial high-level discussions with scientific and government leaders to define the problem and possible solutions, and develop educational materials;
- Biosafety organizations could assist with the development of a risk management process;
- CRDF Global or similar organization could help fund projects to support the development and implementation of waste management procedures at research and diagnostic laboratories;
- Operational organizations could help train scientists and health officials, maintain equipment, and develop procedures;
- Universities could assist with the development of institution-wide policies, scientific characterization of infectious diseases risks found in laboratory waste, and passive transfer of practices through collaborative research and exchange;
- Wildlife biologists could facilitate characterization of infectious disease risks from laboratory waste.

If funded, this collaborative project would help increase coordination between bioengagement activities; enhanced coordination is a recommended process improvement drawn from lessons learned from scientific engagement programs, review of existing biosafety and biosecurity regional efforts, and the North African and Middle Eastern consultations. CBEP and BEP, and other relevant funders, could coordinate their funding efforts by supporting such a collaborative project. If carried out jointly with regional scientists and health officials and supported by government leaders, the project could garner local ownership and increase its likelihood of long-term implementation. Evaluation criteria could be developed for the entire project and individual components of the project.

Group C: S&T Agreements

Opportunity #4 (reviving the Science and Technology Agreements) is probably the most challenging of the recommended opportunities to implement because very little funding, if any, is generally allocated to supporting implementation of bilateral S&T Agreements. Despite the importance of bilateral S&T Agreements to science diplomacy, these instruments are often viewed as purely scientific. However, bilateral S&T Agreements were signed with several MENA countries after 2001 to counter the threat of terrorism.

The responsible agency for implementing the Agreements is the U.S. Department of State Oceans, Environment, and Science (OES) Bureau. However, several U.S. government agencies could provide funding through existing S&T Agreements to support scientific cooperation that meets their missions. For example, CBEP and BEP could support activities that meet their missions, including convening scientific conferences on emerging infectious diseases (including ‘especially dangerous pathogens’); enhancing laboratory and institutional capacity to address biological risks according to international standards; or building scientific capacity to prevent misuse or theft of biological research or results. Other U.S. agencies – such as CDC, NIAID, and ARS – could provide financial support for scientific cooperation administered through the S&T Agreements or expertise in assessing and mitigating safety and security risks.

Group D: Cooperation and Exchange

Opportunity #5 (scientific cooperation in the life sciences and behavioral sciences) and *Opportunity #6* (scientific exchange) comprise a relational group that promote the building of partnerships between scientists and transfer of scientific expertise and knowledge. Scientific cooperation and exchanges serve many purposes, from promoting high-quality science to address a critical health or agricultural problem to sharing of risk assessment and mitigation practices. Several U.S. government agencies support scientific collaboration and exchange to promote scientific research and partnerships; these organizations include NIAID, CDC, ARS, the National Science Foundation (NSF) and the Office of Naval Research Global (ONRG). However, CBEP also supports research collaboration and exchange on infectious diseases and measures to counter harmful infectious disease outbreaks. BEP often supports scientific exchanges to enhance laboratory biosafety and biosecurity training; it could enrich its efforts by supporting research collaborations. NSF could support joint research in the behavioral sciences.

In addition to agencies that could support and/or assist the recommended opportunities, other U.S. government agencies found the opportunities highly relevant to their policy interests. For example, the Department of State Arms Control, Verification, and Compliance Bureau has a Bio-Transparency and Openness Initiative, within which several of the opportunities could be shared with other countries to demonstrate U.S. assistance efforts in promoting compliance with the Biological and Toxins Weapons Convention and United Nations Security Council Resolution 1540. The Department of State's BioPolicy staff could describe the United States' promotion of Article 10 (foreign assistance) in supporting bioengagement efforts to help MENA countries develop national strategies and regional activities. The recommended opportunities meet the objectives of the 2009 National Strategy for Countering Biological Threats, which specifically includes scientific cooperation.

	DTRA/ CBEP	State/ BEP	State/ AVC	State/ BPS	State/ OES	CDC	NIAID	NSF	ONRG	Army/ Air Force	USDA/ ARS	USAID
National Strategies and Implementation Plan	●	●	●	●							●	
Regional Efforts - Scientific Cooperation, Resource Development, Strategies	●	●	●	●							●	●
Procedures for Laboratory Waste Management	●	●	●	●		●	●				●	
Procedures for Transportation of Hazardous Biological Materials	●	●	●	●		●	●				●	
Science and Technology Agreements					●	●	●	●			●	●
Scientific Cooperation - Life Sciences	●	●	●	●	●	●	●		●		●	●
Scientific Cooperation - Behavioral Sciences	●		●					●		●		
Scientific Exchanges	●	●	●		●	●	●	●	●		●	●

Table 1. Relevance of Opportunities to U.S. government agencies.

Conclusion

Over the past two years, the broader Middle East and North African region has experienced significant challenges. Several countries across the region have experienced significant social and political unrest while others struggle with the aftermath of chemical weapons use in Syria. The uncertain political leadership in several countries has already resulted in a change of policy on U.S. scientific engagement towards certain countries (e.g., Egypt). The reemergence of polio in Syria and neighboring countries has raised broader health care and public health concerns in these countries. The closing of the U.S. Embassy in Yemen has delayed (and perhaps also ended) many, but not all, of the science engagement efforts between the U.S. and Yemeni scientists. Despite these challenges, scientific engagement that builds on local needs and carried out in full partnership between U.S. and regional scientists and/or health officials could help to minimize potential biological risks for the enhanced safety and security of the region and international community.